Preventing Mobile Bill Shock

▶ Building transparency and user control into service plans

bridgewater
SYSTEMS

THE MOBILE PERSONALIZATION COMPANY

Introduction

The growth in use of smartphones and bandwidth-hungry mobile services has increased the volume of data crossing mobile networks, significantly raising revenues from mobile broadband services in the process. This boon to operators has also resulted in consumer bill shock – the unpleasant and angry reaction of subscribers to unexpectedly high mobile data bills, whether incurred while roaming or domestically.

At a time when operators are increasingly reliant on data revenues to offset declining voice revenues, they can ill-afford to alienate their subscribers with this kind of negative experience.

In the United States, a survey conducted by the Federal Communications Commission (FCC) revealed that one in six mobile users has experienced bill shock. Furthermore, 84 per cent said their service providers did not contact them when they were about to exceed their allowed minutes, text messages, or data downloads. More than a third of respondents who experienced bill shock said their bills jumped by at least $50, and 23 per cent said the increase was $100 or more.

These figures are not surprising, with mobile data services now as essential as voice services for many subscribers. Data is now a major driver in the choice of operator, plan and device, with mobile data revenues projected to surge to $330 billion worldwide by 2013 according to Informa Telecoms & Media.

The success of mobile data requires operators to optimize the allocation of limited network resources and to ensure that subscribers can get the most value out of their plans – including complete usage transparency.

Transparency – What does a megabyte look like?

While it's relatively easy to keep track of voice calls – essentially how much time is spent on the phone – monitoring data usage is more challenging for subscribers. Time spent online is difficult to track these days – as most devices connect when switched on and maintain their connection for the entire time that they are active on the network. Moreover, the time spent online is relatively meaningless in today's mobile data environment, as subscriber data usage is often measured and billed based on the volume of data transferred, not based on the time that the device is connected to the network. To make things worse, always-on applications on newer devices such as the iPhone or those based on Google Android can pull data from the network in the background without the subscriber being aware of this usage.

This lack of transparency has contributed to a situation where subscribers typically have no idea how much bandwidth they are consuming, how close they are to exceeding their monthly data allowance, and what impact their activity will have on their monthly bill.

As painful as bill shock is for unsuspecting subscribers, it is also proving to be a major headache for operators as they attempt to deal with a range of repercussions including unhappy customers, bill forgiveness, increased churn, and government regulation.

This paper highlights the challenges of an environment where mobile data traffic is rising more sharply than data revenues and where regulators are demanding greater cost transparency for the customer. It also profiles two case studies of operators in Europe and the U.S. who are deploying Bridgewater's solutions to prevent mobile bill shock for their customers.

As operators increasingly evolve from flat-rate data plans to tiered usage models, the paper discusses how operators can prevent mobile bill shock and differentiate their offerings through a more personalized and transparent mobile experience for the consumer.

Regulation as a catalyst for change

The rash of high-profile bill shock cases – often due to heavy data usage while roaming – has caused consumer uproar and triggered regulatory activities in both the U.S. and Europe.

In March 2009, the European Commission introduced new legislation aimed at eliminating bill shock while roaming in the European Union (EU). The first phase of this legislation came into effect on March 1st, 2010, and operators are now required to introduce maximum financial limits of €50 per month for data roaming charges, which is enforced on an opt-in basis until July 1st, when all customers will be capped unless the consumer chooses to opt-out or modify their cap.

European operators are also now required to warn customers when 80 per cent of this limit is reached. Once the full limit is reached, another notification must be sent indicating the procedure to be followed if the customer wishes to continue data roaming. On May 11th, 2010, the FCC's Consumer and Governmental Affairs Bureau (CGB) announced an initiative on bill shock, calling for industry input on technical methods to alert consumers about potential high charges, increase cost transparency, and provide usage controls. The industry was given 45 days to prepare comment in one of the first initiatives undertaken by the Commission's Consumer Task Force which was launched in January 2010.

Case Study: European Subsidiary of Global Mobile Operator

The Bridgewater® Policy Controller (PCRF) was deployed by a European operator to comply with EU legislation today and future-proof their network.

The operator required separate data bundles for home and roaming data use in neighboring countries. This required complex modeling of cascading quotas, enabling customers to have buckets of data for home zones – with a fair usage policy – and separate bundles for each roaming zone.

Flexible per-subscriber limits can be set or amended at any time by the subscriber – in line with travel plans or personal financial limits, which can be applied dynamically and automatically.

By deploying the Bridgewater Policy Controller, this operator is now able to create new solutions such as enforcing fair usage limits or downspeeding as appropriate and providing new, imaginative data plans.

The self-service mobile portal framework is integrated with the Policy Controller, enabling users to set their limits or for the operator to over-ride these limits to meet regulatory guidelines and offer complete control to subscribers.

While regulatory pressure forces mobile operators to implement bill shock prevention measures, there is also compelling evidence to suggest that operators can turn the fight against bill shock to their advantage. New regulations are an opportunity for differentiation, with operators providing consumers with powerful and transparent tools to manage their mobile data services. Transparency above and beyond the level required to achieve compliance builds the trust and confidence to make full use of mobile data services, which is essential to growth.

Transparent control over usage also appeals to enterprise customers, enabling organizations to set data usage limits that apply to their employees, with a view to implementing corporate policies that improve productivity and manage costs. In addition, parents want control and transparency over their children's mobile data usage. This includes setting caps for minors as part of a service plan that allows different caps for different family members.

Beyond regulation

THE CONSUMER PERSPECTIVE

Consumers often experience frustration through every stage of the mobile data experience; when they sign up for data services, when they use them, and when they receive the bill at the end of the month.

Many operators offer a variety of service options, ranging from flat-rate plans with fair usage caps to tiered service packages with per-megabyte overage charges. In many cases, complicated on-network and roaming charges – with small-print clauses on fair usage or overage fees – add to consumer confusion about mobile data usage.

Most consumers are unaware of their data usage consumption and, more importantly, how their application or mobile Internet usage relates to their monthly plan or current spend. Some avoid mobile data use by turning it off since they are unaware of which activities will trigger high fees. Even consumers who know they are about to hit their monthly traffic cap have little flexibility to change their plans to accommodate real-time needs, without calling into the operator's customer care center.

In an environment in which flat-rate data plans are now giving way to tiered usage models, lack of transparency can deter potential subscribers from signing up for service, or prevent them from using all of the features that they are paying for – features that are designed to increase customer loyalty.

For operators this means that consumers will regularly breach caps without knowing it – resulting in unpopular overage charges or bill forgiveness – where the operator swallows the extra bandwidth costs in order to maintain the customer relationship.

The Operator Challenge

The lack of consumer transparency into data usage also presents operators with complex challenges, including the potential for customer churn, the threat of costly litigation, and negative publicity. The best way to address these painful challenges is to ensure that subscribers do not incur unintended charges in the first place – but it is crucial that operators do so without imposing hard limits that negatively impact the subscriber experience.

To strike the right balance, operators must go beyond action purely driven by regulatory compliance and address the wider issue of how subscribers can personalize their services and manage their online activities on an ongoing basis. There are multiple but complementary steps that operators can take:

- ▶ **Empower subscribers** with the flexibility and control to set up their account options on the basis of their usage models, providing them with an easy-to-use, intuitive interface to change personal settings as needed. This includes enabling personalized data usage limits that can be set by individual subscribers, family plan members, and enterprise users.

- ▶ **Provide transparent access to account information**, including usage-to-date and allowances that help subscribers understand their data usage and manage it more effectively over the billing cycle. This information can be made available on a self-service portal, or even more conveniently as an application that is immediately accessible by the customer on the device.

- ▶ **Enable temporary override settings** in response to specific events, such as attending a video conference call or watching highlights of a football match. Providing the casual user with the ability to pay for additional speed or bandwidth on the occasion when they really need it is a powerful tool.

- ▶ **Offer data usage information** in the form of proactive notifications to subscribers about thresholds including approaching monthly limits, additional charges to be imposed during international roaming, or downspeeding triggered by sustained high traffic. This proactive notification is essential to building consumer confidence in the adoption and use of data services.

Offering such transparency and user control has powerful benefits for operators, with service differentiation key to ongoing growth in mobile data services. As flat-rate plans are phased out in favor of tiered or metered pricing models, subscribers are more likely to take up plans where cost controls are built in – whether for domestic use, roaming or both. These cost controls foster greater consumer trust and satisfaction, which equates to less churn and a reduction in call center activity and, therefore, lower operating costs.

There are other cost and revenue implications to consider. Lack of visibility into roaming charges has many users frequently turning data off while roaming abroad or outside of their home network. This results in lost revenue for operators. Offering consumers real-time control over roaming limits not only enables operators to meet regulations but builds certainty and trust.

This control will also prevent the kind of cases that have made the headlines: bills that have hit many thousands of euros or dollars where bill forgiveness is necessary. Bill forgiveness not only reduces revenue coming to the operator, but in cases of roaming, where interconnection fees from the roaming partner are unlikely to be forgiven, an additional cost to the 'home' operator.

Bridgewater's Policy-Based Solutions to Prevent Mobile Bill Shock

THE BRIDGEWATER POLICY CONTROLLER

The market-leading Bridgewater Policy Controller is the cornerstone of Bridgewater's bill shock prevention solution in GSM/HSPA (see Figure 1) and CDMA/EVDO networks. The policy control function provides real-time network, application, and subscriber policies to manage mobile data growth, ensure fair usage, prevent mobile bill shock, and deliver personalized services. It is anchored by Bridgewater's Subscriber Data Broker™, a subscriber data management platform that brings together subscriber profile, state and usage information with the tools to broker that information to systems and applications to personalize services. This enables the Policy Controller to adapt in real time to multiple simultaneous changes in subscriber behavior, preferences and application choices, as well as network conditions.
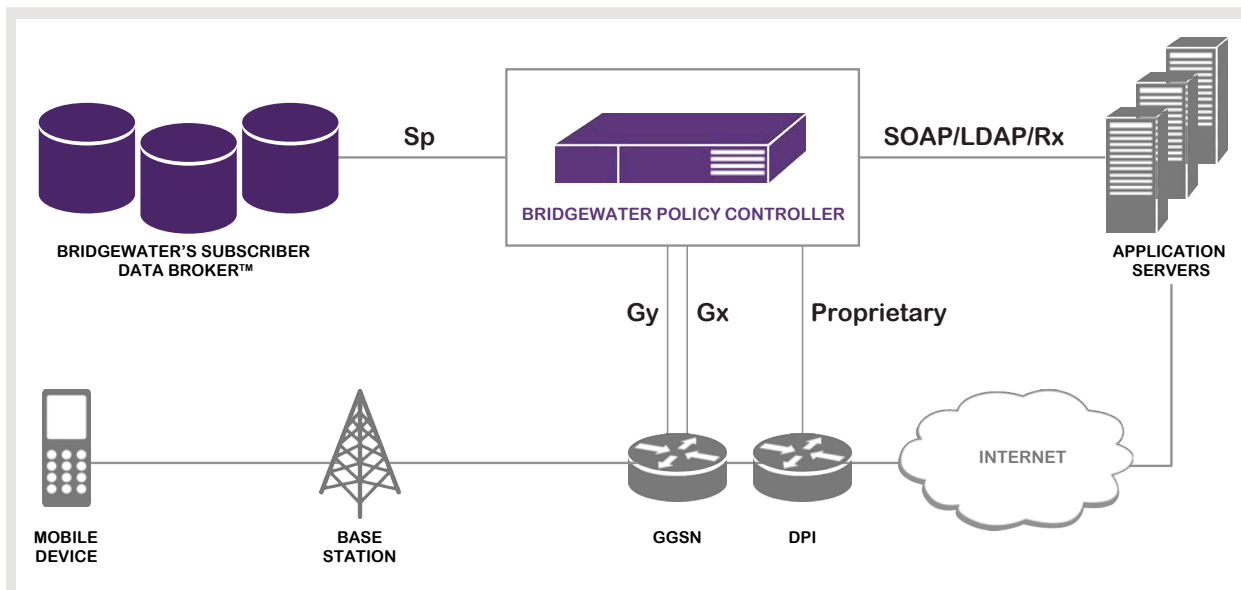

Figure 1: Bridgewater Policy Controller in a GSM/HSPA Network

The Policy Controller supports the key mobile data bill shock prevention measures required to comply with legislative demands, including those imposed by the EU and being considered by the FCC. Bridgewater's solution also enables the operator to send proactive, personalized and timely notifications regarding subscriber data usage by collecting and storing usage information in real time.

The Policy Controller features a metering capability that manages usage according to individual thresholds, and alerts and prompts a notification to be sent to the user, for example, when they reach 80 per cent of their usage threshold. As a result, bandwidth controls can be altered dynamically based on the option chosen by the subscriber – reduce service, cap service, or provide a boost for a predetermined time.

This solution provides choices when customers reach a usage threshold – such as redirection to a payment portal or graceful downspeeding to avoid service cutoff. The Policy Controller provides a platform for service innovation and business value to support services such as fair usage enforcement, tiered services, day passes, and bandwidth management.

The Policy Controller supports Third Generation Partnership Project (3GPP) standards-based controls such as the Policy and Charging Rules Function (PCRF) in 3G (Release 7) and LTE (Releases 8 and 9) networks, thereby providing a future-proof platform. The Bridgewater Policy Controller can also be deployed in CDMA/EVDO networks to prevent mobile bill shock (see Figure 2). It provides the unique ability to meter subscriber usage in real-time, in both the home network and partner networks, by extracting the relevant data from existing RADIUS accounting records. When subscribers reach their data usage limit, the Policy Controller applies the appropriate policy rule dynamically to take a specific action, such as downspeeding or suspending their usage, or redirecting them to a portal, depending on operator requirements. This bill shock solution easily augments existing Bridgewater® Service Controller (authentication, authorization and accounting or AAA) deployments, and can also utilize on-board RADIUS functionality to receive usage information from third party AAA systems. It provides the functional capabilities required for usage-based policy control features such as fair usage, tiered services, pre-purchase plans and roaming data plans for example.

The Policy Controller provides automated notifications to subscribers via SMS or e-mail with information about their usage and to inform them of any action that will be taken when the limits are reached.
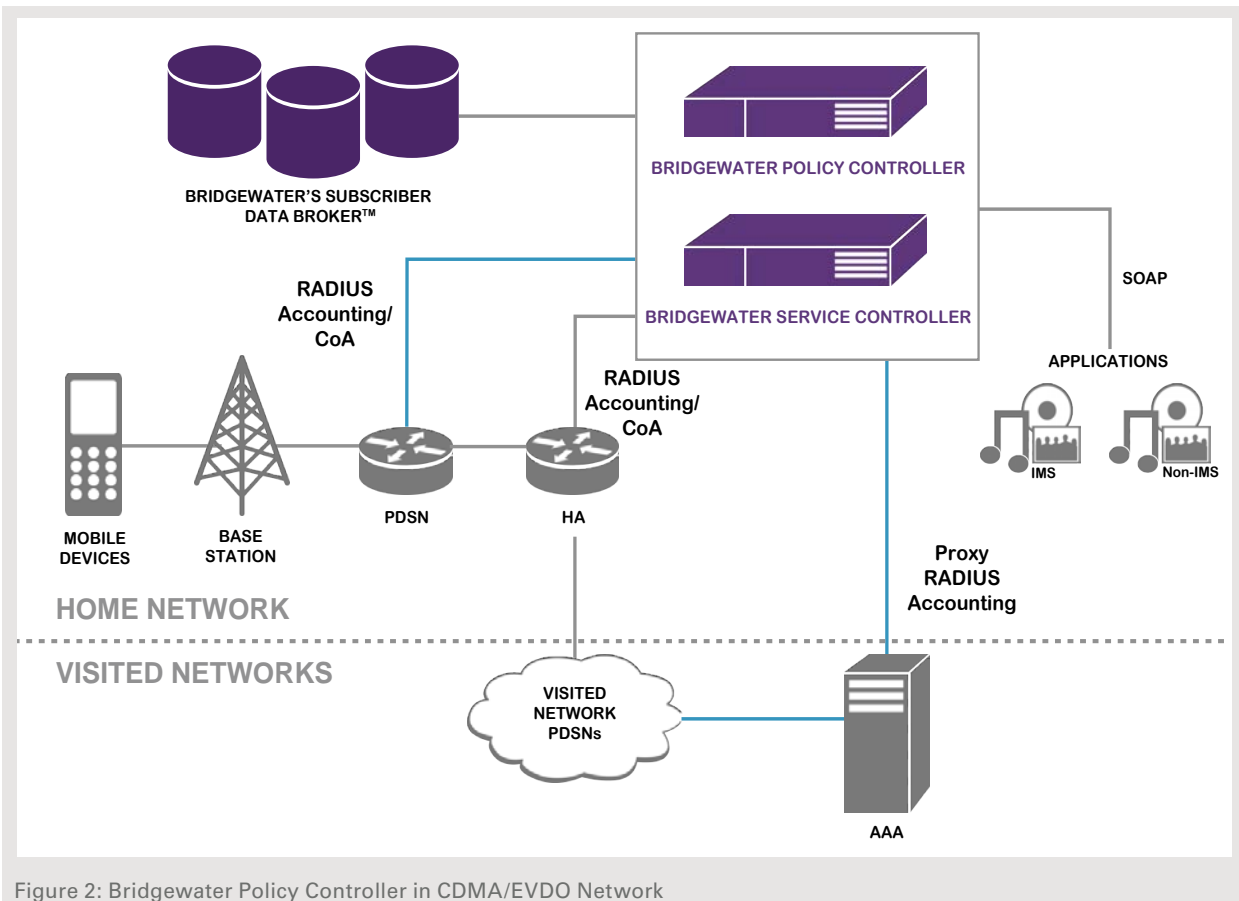
Figure 2: Bridgewater Policy Controller in CDMA/EVDO Network

Bridgewater's myPolicy Solution

Bridgewater's award-winning myPolicy™ solution (Figure 3) enables mobile operators to give subscribers complete control over their mobile experience. Underpinned by the Bridgewater Policy Controller, myPolicy is an application that resides on the subscriber's mobile device or laptop, enabling users to track, manage, and cap their data service usage by setting their own notifications, limits, and cut-off points. These limits, which can be based on data volumes or cost, help mobile data customers avoid bill shock and take full control of their experience including:

- **My Usage**: Tracking real-time data, SMS and applications usage, as well as voice and roaming charges anytime, anywhere.

- **My Limits**: Setting personalized limits, notifications, and roaming controls to manage mobile usage and prevent bill shock.

- **My Offers**: Receiving special offers in real time such as day passes for new applications, roaming passes for subscribers who are traveling, bandwidth top-ups, or free SMS with mobile advertising.

Figure 3: Bridgewater's myPolicy Solution for Mobile Devices

myPolicy enables operators to drive incremental revenues with personalized services such as roaming or application of day passes, bandwidth boosts, and special event offers based on usage or location.

Meanwhile, better customer loyalty is driven by empowering consumers and enterprises to set their own policies, limits and notifications including mobile usage at home, in the office, and while roaming. In turn, customer service costs are reduced by giving subscribers the freedom to set their own policies and monitor usage in real time on their mobile devices.

myPolicy enhances the mobile data experience, with personalized controls and dynamic usage monitoring.

Operator Benefits

As a first step towards mobile data usage transparency, some European operators have modified existing revenue-management systems to help them meet legislative requirements and increase customer confidence. However, these systems are often unable to support the use cases that operators need in order to provide additional value to their customers.

Bridgewater's policy-based solution offers the flexibility that operators require, with some distinct advantages that provide incremental business value:

▶ **Beyond service blocking**: the Bridgewater Policy Controller has proven interoperability with policy enforcement points and the flexibility to support other options such as the ability to gracefully downspeed or, perhaps more importantly, offer choices to customers – purchase a boost or a roaming day pass, or use advertising funded service extensions. This preserves revenue that may not be realized due to service termination, and in times of high network use, can protect the network using policy enabled fair usage controls.

▶ **Personalized rules**: a key part of offering a flexible service requires that mobile operators offer subscribers cut-off limits that they can set and modify. Bridgewater's solutions enable mobile operators to set flexible rules for different customer types and extend policy control to smartphone clients to provide total personalization while roaming or on the home network.

▶ **Extensible platform beyond legislation**: the Bridgewater Policy Controller provides real-time network, application, and subscriber policy control that allows operators to manage mobile data growth and deliver personalized services. It is unique in the industry in leveraging multiple types of policy that work together to deliver a superior mobile experience. It also supports subscriber policy capabilities that give subscribers direct policy control over their own mobile usage including: tracking real-time data, SMS, and applications usage; setting personalized limits, parental controls, and notifications; and receiving special offers.

Case Study: U.S. Rural Mobile Operator

This EVDO operator selected Bridgewater's myPolicy solution for Research in Motion's BlackBerry®. This application gives subscribers greater control over their mobile data usage through real-time, mobile data usage tracking, and the ability to set personalized limits and notifications.

The operator is implementing volume-based metering across all mobile data customers on its 3G EVDO network. This approach will build greater customer loyalty and drive incremental revenue streams by giving subscribers greater freedom to manage their mobile data usage and personalize their services.

The deployment is enabling this operator to turn on mobile data roaming away from the home network while offering users complete control and transparency over data costs.

▶ **Vendor-neutral platform**: the Bridgewater solution interoperates with existing charging systems to rate metered usage in real time. This eliminates the need for expensive back end modifications to existing charging systems, enabling rapid deployment and supporting incremental services beyond the data roaming legislation.

▶ **Real-time metering**: the Bridgewater Policy Controller uses standard 3GPP interfaces to perform data usage metering within individual user sessions, which allows policy decisions to be applied in real time in response to specific user behavior.

▶ **Dynamic mid-session modifications**: this allows for immediate service response and control when a usage threshold is reached. It minimizes operational costs associated with offline analysis of subscriber usage and provisioning of usage limits, and reduces calls to the customer care desk from dissatisfied customers.

▶ **Notification framework**: This supports flexible, proactive subscriber notification such as email or SMS so that operators can set multiple, flexible notification thresholds by customer, beyond the minimum requirement. It provides the opportunity for greater customer intimacy and interaction with customers.

▶ **Unique client controls**: Bridgewater's myPolicy solution for Research in Motion's BlackBerry, the Apple iPhone, smartphones, and laptops allows subscribers to conveniently take control of their mobile data experience on their devices.

Conclusion

Mobile bill shock is fundamentally detrimental to the subscriber experience, preventing uptake of new services and generating significant bad publicity for operators. Regulation in Europe and the FCC's activities in the U.S. mean that operators must act now to improve the mobile data experience of their subscribers. However, these catalysts for implementing bill shock prevention measures offer operators a far greater opportunity than compliance alone.

Operators stand to benefit by leading the evolution towards a more transparent and powerful framework that hands control of the mobile experience over to the consumer and allows operators to use their network resources more efficiently.

Complete transparency has become even more relevant as the industry moves away from flat-rate data packages to pricing based on usage tiers. Operators that provide greater transparency also benefit from a closer dialogue with their consumers based on real-time analysis of consumer attitudes, preferences, and usage models.

Unification of subscriber, application, and network information by applying a policy control approach enables mobile operators to manage data traffic, prevent mobile bill shock, ensure fair usage and give subscribers greater control of their mobile data experience.

Importantly, as voice revenues continue to fall, this smart approach both creates additional revenue opportunities for operators by removing barriers to service adoption (or in some cases service creation), and prevents the painful cost associated with bill forgiveness, whether on the home network or while roaming.

Bridgewater Systems, the mobile personalization company, enables service providers to efficiently manage and profit from mobile data services, content and commerce. The company's market leading mobile personalization portfolio provides a real-time, unified view of subscribers including entitlements, devices, networks, billing profiles, preferences and context. Anchored by Bridgewater's Subscriber Data Broker™, the **portfolio of carrier-grade and standards-based products includes the Bridgewater**® Service Controller (AAA), **the Bridgewater**® Policy Controller (PCRF) and the Bridgewater® Home Subscriber Server (HSS). More than 150 leading service providers including America Movil, Bell Canada, Clearwire, Hutchison Telecom, Iusacell, Scartel, SmarTone-Vodafone, Sprint, Tata Teleservices, Tatung, Telmex, Telstra, and Verizon Wireless use Bridgewater's solutions to rapidly deliver innovative mobile services to over 150 million subscribers. For more information, visit us at **www.bridgewatersystems.com.**